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Ransom-Jones, Emma; McDonald, James

Genome Announcements

DOI:

[10.1128/genomeA.00985-16](https://doi.org/10.1128/genomeA.00985-16)

Published: 22/09/2016

Publisher's PDF, also known as Version of record

[Cyswllt i'r cyhoeddiad / Link to publication](#)

Dyfyniad o'r fersiwn a gyhoeddwyd / Citation for published version (APA):

Ransom-Jones, E., & McDonald, J. (2016). Draft Genome Sequence of *Clostridium* sp. strain W14A isolated from a cellulose-degrading biofilm in a landfill leachate microcosm. *Genome Announcements*, 4(5), [e0098516]. <https://doi.org/10.1128/genomeA.00985-16>

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Draft Genome Sequence of *Clostridium* sp. Strain W14A Isolated from a Cellulose-Degrading Biofilm in a Landfill Leachate Microcosm

Emma Ransom-Jones,  James E. McDonald

School of Biological Sciences, Bangor University, Bangor, United Kingdom

Here, we report the draft genome of *Clostridium* sp. strain W14A, isolated from the anaerobic, cellulolytic biofilm of a cotton string sample incubated in a landfill leachate microcosm. The draft genome comprises 131 contigs, 3,823,510 bp, 51.5% G+C content, and 4,119 predicted coding domain sequences.

Received 21 July 2016 Accepted 1 August 2016 Published 22 September 2016

Citation Ransom-Jones E, McDonald JE. 2016. Draft genome sequence of *Clostridium* sp. strain W14A isolated from a cellulose-degrading biofilm in a landfill leachate microcosm. *Genome Announc* 4(5):e00985-16. doi:10.1128/genomeA.00985-16.

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Address correspondence to Emma Ransom-Jones, e.ransom-jones@bangor.ac.uk.

Members of the genus *Clostridium* have been consistently detected as abundant members of the landfill microbial community (1–4), but few species have been isolated from this environment. The majority of landfill clostridia contribute to the hydrolysis of cellulose that represents the most abundant biodegradable component of landfill waste (1, 2).

Clostridium strain W14A was isolated from dewaxed cotton string incubated in a landfill leachate microcosm previously described by McDonald et al. (3), via the anaerobic roll tube method of Hungate (5), using modified M2GSC broth medium as described by Miyazaki et al. (6) with rumen fluid omitted. DNA extraction was performed using the Wizard Genomic DNA purification kit (Promega) and quantified using a Qubit Fluorometer (Life Technologies). Genome sequencing was performed by MicrobesNG (Birmingham) with the genomic DNA library prepared using the Nextera XT library prep kit (Illumina) following the manufacturer's protocol with the following modifications: 2 ng of DNA instead of 1 were used as input, and PCR elongation time was increased to 1 min from 30 s. DNA quantification and library preparation were carried out on a MicroLab STAR automated liquid handling system (Hamilton). Libraries were sequenced on the Illumina HiSeq using a 250 bp paired end protocol.

Reads were adapter trimmed using Trimmomatic 0.30 with a sliding window quality cutoff of Q15 (7) and *de novo* genome assembly was carried out with SPAdes (version 3.7) (8) via MicrobesNG (Birmingham). Annotation was performed via the RAST server (version 2.0) (9). The draft genome comprises 131 contigs, 3,823,510 bp and 51.5% G+C content as determined by RAST (9). Genome comparison via RAST (9) and 16S rRNA gene analysis (data not shown) suggests that *Clostridium* sp. strain W14A is a novel species most closely related to *Clostridium leptum* DSM 753. The genome contains 4,119 predicted coding domain sequences and 366 subsystems, and includes genes involved in sucrose, maltose, lactose and galactose utilization, and spore formation.

Accession number(s). This whole-genome shotgun project has been deposited at DDBJ/ENA/GenBank under the accession no. [MBSV000000000](https://www.ncbi.nlm.nih.gov/nuclseq/MBSV000000000/). The version described in this paper is the first version.

ACKNOWLEDGMENT

This research was funded by the BBSRC (grant BB/L002043/1).

FUNDING INFORMATION

This work was funded by Biotechnology and Biological Sciences Research Council (BBSRC) (BB/L002043/1).

REFERENCES

1. Van Dyke MI, McCarthy AJ. 2002. Molecular biological detection and characterization of *Clostridium* populations in municipal landfill sites. *Appl Environ Microbiol* 68:2049–2053. [http://dx.doi.org/10.1128/AEM.68.4.2049-2053.2002](https://doi.org/10.1128/AEM.68.4.2049-2053.2002).
2. Burrell PC, O'Sullivan C, Song H, Clarke WP, Blackall LL. 2004. Identification, detection, and spatial resolution of *Clostridium* populations responsible for cellulose degradation in a methanogenic landfill leachate bioreactor. *Appl Environ Microbiol* 70:2414–2419. [http://dx.doi.org/10.1128/AEM.70.4.2414-2419.2004](https://doi.org/10.1128/AEM.70.4.2414-2419.2004).
3. McDonald JE, Houghton JN, Rooks DJ, Allison HE, McCarthy AJ. 2012. The microbial ecology of anaerobic cellulose degradation in municipal waste landfill sites: evidence of a role for fibrobacters. *Environ Microbiol* 14:1077–1087. [http://dx.doi.org/10.1111/j.1462-2920.2011.02688.x](https://doi.org/10.1111/j.1462-2920.2011.02688.x).
4. Bareither CA, Wolfe GL, McMahon KD, Benson CH. 2013. Microbial diversity and dynamics during methane production from municipal solid waste. *Waste Manage* 33:1982–1992. [http://dx.doi.org/10.1016/j.wasman.2012.12.013](https://doi.org/10.1016/j.wasman.2012.12.013).
5. Hungate RE. 1947. Studies on cellulose fermentation: III. The culture and isolation of cellulose-decomposing bacteria from the rumen of cattle. *J Bacteriol* 53:631–645.
6. Miyazaki K, Martin JC, Marinsek-Logar R, Flint HJ. 1997. Degradation and utilization of xylans by the rumen anaerobe *Prevotella bryantii* (formerly *P. ruminicola* subsp. *brevis*) B₄A. *Anaerobe* 3:373–381. [http://dx.doi.org/10.1006/anae.1997.0125](https://doi.org/10.1006/anae.1997.0125).
7. Bolger AM, Lohse M, Usadel B. 2014. Trimmomatic: a flexible trimmer for Illumina sequence data. *Bioinformatics* 30:2114–2120. [http://dx.doi.org/10.1093/bioinformatics/btu170](https://doi.org/10.1093/bioinformatics/btu170).
8. Bankevich A, Nurk S, Antipov D, Gurevich AA, Dvorkin M, Kulikov AS, Lesin VM, Nikolenko SI, Pham S, Prjibelski AD, Pyshkin AV, Sirotkin AV, Vyahhi N, Tesler G, Alekseyev MA, Pevzner PA. 2012. SPAdes: a new genome assembly algorithm and its applications to single-cell sequencing. *J Comput Biol* 19:455–477. [http://dx.doi.org/10.1089/cmb.2012.0021](https://doi.org/10.1089/cmb.2012.0021).
9. Aziz RK, Bartels D, Best AA, DeJongh M, Disz T, Edwards RA, Formsma K, Gerdes S, Glass EM, Kubal M, Meyer F, Olsen GJ, Olson R, Osterman AL, Overbeek RA, McNeil LK, Paarmann D, Paczian T, Parrello B, Pusch GD, Reich C, Stevens R, Vassieva O, Vonstein V, Wilke A, Zagnitko O. 2008. The RAST server: Rapid Annotations using Subsystems Technology. *BMC Genomics* 9:75. [http://dx.doi.org/10.1186/1471-2164-9-75](https://doi.org/10.1186/1471-2164-9-75).